MAYO CLINIC LABORATORIES

Test Definition: SLL

Small Lymphocytic Lymphoma, FISH, Tissue

Overview

Useful For

Detecting, at diagnosis, recurrent common chromosome abnormalities in patients with small lymphocytic lymphoma (SLL) in paraffin-embedded tissue specimens

Distinguishing patients with 11;14 translocations who have mantle cell lymphoma from patients who have SLL

Detecting patients with atypical SLL with translocations between *IGH* and *BCL3*

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
_PRAG	Probe, Each Additional (SLL)	No, (Bill Only)	No

Testing Algorithm

This test includes a charge for the probe application, analysis, and professional interpretation of results for one probe set (2 individual fluorescence in situ hybridization [FISH] probes). Additional charges will be incurred for all reflex or additional probe sets performed. Analysis charges will be incurred based on the number of cells analyzed per probe set. If no cells are available for analysis, no analysis charges will be incurred.

This test may be ordered in 2 distinct ways allowing different combinations of probes to be analyzed based on the clinical question.
1. Standard (diagnostic) small lymphocytic lymphoma (SLL) FISH panel
2. Individual SLL FISH probes chosen, per **client request**, from probes listed below

If individual SLL FISH probes are needed, the specific probes requested must be noted on the request form or in the reason for referral. If no FISH probes are indicated, the standard (diagnostic) panel will be performed.

The standard (diagnostic) SLL FISH panel includes testing for the following abnormalities using the FISH probes listed:
6q-, D6Z1/MYB probe set
11q-, D11Z1/ATM probe set
+12, D12Z3/MDM2 probe set
13q-, D13S319/LAMP1 probe set
17p-, TP53/D17Z1 probe set
t(11;14)(q13;q32) or *IGH::CCND1* fusion, CCND1/IGH probe set

Appropriate ancillary probes may be performed at consultant discretion to render comprehensive assessment. Any additional probes used will have the results included within the final report and will be performed at an additional charge. In the following situations, additional (reflex) testing may be performed at the laboratory's discretion and may be influenced by available karyotype results or other FISH testing.

In the absence of *IGH::CCND1* fusion, when an extra IGH signal is identified, testing using the IGH/BCL3 probe set may be performed to identify a potential *IGH::BCL3* fusion, t(14;19)(q32;q13).

In the absence of *IGH::CCND1* fusion, when an extra or atypical CCND1 signal is identified, testing using the CCND1 break-apart probe set may be performed to identify a potential variant translocation involving *CCND1,* t(11;var)(q13;?).

Method Name
Fluorescence In Situ Hybridization (FISH)

NY State Available
Yes

Specimen

Specimen Type
Tissue

Ordering Guidance
This test does not include a pathology consultation. If a pathology consultation is requested, order PATHC / Pathology Consultation and the appropriate fluorescence in situ hybridization test (FISH) test will be added and performed at an additional charge.

Mayo Hematopathology consultants are involved in both the preanalytic (tissue adequacy and probe selection, when applicable) and postanalytic (interpretation of FISH results in context of specific case, when applicable) phases.

This test is **not appropriate** for testing blood and bone marrow from patients with chronic lymphocytic leukemia. If a non-paraffin embedded bone marrow or blood sample is received for this test, the test will be canceled and automatically reordered by the laboratory as CLLDF / Chronic Lymphocytic Leukemia (CLL), Diagnostic FISH, Varies or CLLMF / Chronic Lymphocytic Leukemia (CLL), Specified FISH, Varies.

Shipping Instructions
Advise Express Mail or equivalent if not on courier service.

Necessary Information
1. A pathology report is required for testing to be performed. If not provided, appropriate testing and/or interpretation may be compromised or delayed. Acceptable pathology reports include working drafts, preliminary pathology, or surgical pathology reports.
2. The following information must be included in the report provided:
-Patient name
-Block number-must be on all blocks, slides, and paperwork
-Date of collection
-Tissue source
3. A reason for testing must be provided. If this information is not provided, an appropriate indication for testing may be entered by Mayo Clinic Laboratories.

4. A list of probes is required if select probes are necessary or if the patient is being tracked for known abnormalities. See Table in Clinical Information.

Specimen Required

Submit only 1 of the following specimens:

Preferred

Specimen Type: Tissue block (fresh tissue is **not acceptable**)

Collection Instructions:

1. Submit a formalin-fixed, paraffin-embedded tumor tissue block.
2. Blocks prepared with alternative fixation methods (eg, Prefer, Bouin's) will be attempted but are less favorable for successful results. Provide fixation method used.

Additional Information:

1. Paraffin-embedded specimens can be from any anatomic location (skin, soft tissue, lymph node, etc).
2. Decalcified paraffin-embedded specimens will have testing attempted; however, the success rate is approximately 50%. **Testing may be canceled** if sufficient tumor tissue is not present.
3. **Submitted fresh tissue specimens will be canceled upon receipt**. If only fresh tissue is available, embed in paraffin prior to sending.

Acceptable:

Specimen Type: Tissue slides

Slides: 1 Hematoxylin and eosin stained and 2 unstained for each probe set

Collection Instructions:

1. Include 1 hematoxylin and eosin-stained slide for the entire test order.
2. If individual probe sets are chosen: For each probe set ordered, 2 consecutive, unstained, 5 micron-thick sections placed on positively charged slides.
3. If a complete small lymphocytic lymphoma (SLL) panel is ordered, submit 14 consecutive, unstained, 5 micron-thick sections placed on positively charged slides.

Forms

If not ordering electronically, complete, print, and send a Hematopathology/Cytogenetics Test Request (T726) with the specimen.

Specimen Minimum Volume

See Specimen Required.

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Tissue	Ambient (preferred)		
	Refrigerated		

Clinical & Interpretive

Clinical Information

Small lymphocytic lymphoma (SLL) is the nonleukemic form of chronic lymphocytic leukemia (CLL), one of the most common leukemias in adults. The most frequently seen cytogenetic abnormalities in SLL involve chromosomes 6, 11, 12, 13, and 17. These are detected and quantified using the SLL fluorescence in situ hybridization (FISH) panel.

Cytogenetics has proven to be a reliable predictor of outcome for patients with CLL. It is unknown if SLL has the same prognostic significance when these genetic abnormalities are observed.

This FISH test detects an abnormal clone in approximately 65% of patients with SLL. Patients with t(11;14)(q13;q32) associated with *IGH::CCND1* fusion, have mantle cell lymphoma which can be distinguished from SLL and other B-cell lymphomas with this assay. Patients with t(14;19)(q32;q13.3) associated with *IGH::BCL3* fusion, may have an atypical form of SLL or another B-cell lymphoma.

Reference Values

An interpretive report will be provided.

Interpretation

A neoplastic clone is detected when the percent of cells with an abnormality exceeds the normal reference range for any given probe set.

A positive result is not diagnostic for small lymphocytic lymphoma but may provide relevant prognostic information.

A negative result does not exclude the diagnosis an SLL clone or another neoplastic disorder.

Cautions

This test is not approved by the US Food and Drug Administration and is best used as an adjunct to existing clinical and pathologic information.

Fixatives other than formalin (eg, Prefer, Bouin's) may not be successful for fluorescence in situ hybridization (FISH) assays. Non-formalin fixed specimens will not be rejected.

Paraffin-embedded tissues that have been decalcified will be attempted but may not be successful for FISH analysis. The success rate of FISH studies on decalcified tissue is approximately 50%.

Fluorescent in situ hybridization studies will be attempted if sufficient tumor is present for analysis. The pathologist reviewing the hematoxylin and eosin-stained slide may find it necessary to cancel testing if insufficient tissue/tumor is available for testing.

If no FISH signals are observed post-hybridization, the case will be released indicating a lack of FISH results.

Clinical Reference

1. Swerdlow SH, Campo E, Harris NL eds. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues. IARC; 2017. WHO Classification of Tumours, Vol 2

2. Shanafelt TD. Predicting clinical outcome in CLL: how and why. Hematology Am Soc Hematol Educ Program. 2009;421-429
3. Van Dyke DL, Werner L, Rassenti LZ, et al. The Dohner fluorescence in situ hybridization prognostic classification of chronic lymphocytic leukaemia (CLL): the CLL Research Consortium experience. Br J Haematol. 2016;173(1):105-113

Performance

Method Description

This test is performed using commercially available and laboratory-developed probes. Deletion of chromosomes 6q, 11q, 13q, and 17p, and trisomy of chromosome 12 are detected using enumeration strategy probe sets. Rearrangements involving *CCND1* are detected using a dual-color break-apart strategy probe set. A dual-color, dual-fusion fluorescence in situ hybridization (D-FISH) strategy probe set is used to detect *IGH::CCND1* rearrangements and for reflex testing to identify *IGH*::*BCL3* rearrangements.

Paraffin-embedded tissues are cut at 5 microns and mounted on positively charged glass slides. The selection of tissue and the identification of target areas on the hematoxylin and eosin (H and E)-stained slide is performed by a pathologist. Using the H and E-stained slide as a reference, target areas are etched with a diamond-tipped engraving tool on the back of the unstained slide to be assayed. For each probe set, the probes are hybridized to the appropriate target areas and 2 technologists each analyze 50 interphase nuclei (100 total). All results are expressed as the percent abnormal nuclei.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

7 to 10 days

Specimen Retention Time

Slides used for analysis are retained by the laboratory in accordance with regulatory requirements. Client provided paraffin blocks and extra unstained slides (if provided) will be returned after testing is complete.

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.

- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

88377-if 1 probe set
88377 x 2-if 2 probe sets
88377 x 3-if 3 probe sets
88377 x 4-if 4 probe sets
88377 x 5-if 5 probe sets
88377 x 6-if 6 probe sets
88377 x 7-if 7 probe sets
88377 x 8-if 8 probe sets

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
SLL	SLL, FISH, Tissue	103621-9

Result ID	Test Result Name	Result LOINC® Value
603129	Result Summary	50397-9
603130	Interpretation	69965-2
603131	Result Table	93356-4
603132	Result	62356-1
GC038	Reason for Referral	42349-1
603133	Specimen	31208-2
603134	Source	31208-2
603135	Tissue ID	80398-1
603136	Method	85069-3
603137	Additional Information	48767-8
603138	Disclaimer	62364-5
603139	Released By	18771-6